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WITNESS my hand this
Seventh day of April 2005

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ORIGINAL

**PROVISIONAL SPECIFICATION FOR AN INVENTION
ENTITLED**

Invention Title: **A BIN COMPACTOR**

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The invention is described in the following statement :

The present invention relates to a rubbish compacting lid assembly for a bin and a bin with a rubbish compacting facility.

Previous attempts have been made to design a bin with a lid that includes means for compacting the contents of the bin. There are some examples in prior 5 patent specifications, for example Patent WO 97/43196 (which is not admitted to be common general knowledge) discloses such a bin.

A problem with the bin compaction arrangement disclosed in this patent specification however is that the mechanism for effecting compaction is exposed and does not provide an arrangement that might be attractive to a user, 10 especially where the bin may be used in a domestic situation.

There is a further problem which is to provide an assembly and a bin which allows for an efficient mechanism which can be arranged to provide also a good compaction pressure and a closure facility.

It is an object of the present invention to provide a bin with a rubbish 15 compacting lid assembly and an assembly for a bin that overcomes or at least ameliorates the above problem with the compacting bins of the prior art.

Other objects and advantages of the present invention will become apparent from the following description, taken in connection with the accompanying drawings, wherein, by way of illustration and example, an embodiment of the 20 present invention is disclosed.

In one form of this invention although this may not necessarily be the only or indeed the broadest form of this there is proposed a bin including an opening to permit access to the bin and a compacting lid assembly; the compacting lid assembly including an upper lid element adapted to close the opening to the bin, a lower compacting element adapted to compact the contents of the bin, the upper and lower elements both being pivotally connected to the bin at respective first ends, such that the pivot points are at least vertically spaced apart; a link, the first end of which is pivotally connected to a second end of the compacting element, the second end of the link being pivotally connected to the 25 lid at a point that remains between the pivot point for the first end of the 30 lid at a point that remains between the pivot point for the first end of the

connecting element and the pivot point of the lid throughout the arc of the lids travel.

In a further form the invention may be said to reside in a compacting lid assembly including a rim adapted to nest in and define an opening to a bin, an upper lid element adapted to close the opening to the rim, a lower compacting element adapted to compact the contents of the bin, the upper and lower elements both being pivotally connected to the rim at respective first ends, such that the pivot points are at least vertically spaced apart; a link, the first end of which is pivotally connected to a second end of the compacting element, the second end of the link being pivotally connected to the lid at a point that remains between the pivot point for the first end of the connecting element and the pivot point of the lid throughout the arc of the lids travel.

In a further form the invention may be said to lie in a rubbish receptacle or bin being a container with an uppermost lid which is connected to the container by a pivot connection so that it can assume by being pivoted about its pivot connection into a closed position with respect to an otherwise open top of the container and in a further position an open position whereby access for introduction of rubbish into the container can be achieved, characterised in that there is a compactor which is located so as to be below the lid when this is in a closed position with respect to the otherwise open top of the container, and is supported at a rearward location by a pivot connection with the container which is aligned to be parallel to the pivot connection of the lid to the container, and which is supported at a forward location by a pivot connection about a parallel axis to the first said pivot, to a link which has its further end pivotally connected to the lid, the relative position of the pivot connections being such that the compactor which includes a compactor member is caused to be lowered with a compacting action as the lid is brought into a closed position, and where an extent of mechanical advantage achieved between any force applied to the lid as compared to a resultant compacting force provided by the compactor against any rubbish within the container is increased as the lid is closed.

Preferably, the alignment of the axis of said pivot connection at the rear of the lid as compared to the axis of the pivot connection between the link and the compactor member is such that the alignment of the axis of the pivot connection between the lid and the link will pass through a plane defined by the first said

two axes so that there will be an over center position reached when the lid is in a closed position, whereby the lid will be kept thereby in a closed position.

Preferably, there is a resilient biasing means extending between a point proximate to the second end of the compacting element and the pivot point of the lid element.

5 Preferably, the resilient biasing means is a spring.

Preferably, when the lid is in the closed position, the connecting element and the line of action of the spring are aligned.

10 Preferably, the spring extends between the point at which the connecting element pivotally connects to the second end of the compacting element, and the pivot point of the lid element.

Preferably, the opening to the bin has a first and second pair of opposing sides, such that the opening is either square or rectangular.

Preferably, the lid element has a handle at the second end.

15 Preferably, the connecting element connects to the lid at a point approximately half way between the pivot point for the lid, and the handle.

Preferably, a rim of the compacting lid assembly is adapted to securely attach to the bin.

20 Preferably, the pivot point for the lid is directly above the rearward pivot point for the compacting element.

For a better understanding of this invention it will now be described with respect to the preferred embodiment which shall be described herein with the assistance of drawings wherein;

25 Figure 1 is a perspective view of the rubbish compacting lid assembly according to the preferred embodiment of the present invention;

Figure 1b is a perspective view of the rubbish compacting lid assembly in Figure 1, showing the assembly separated from the bin;

Figure 1c is a perspective view of the rubbish compacting lid assembly in Figure 1, showing the lid in a closed position;

5 Figure 2 is a side plan view of the rubbish compacting lid assembly in Figure 1;

Figures 3a to e are side plan views of the rubbish compacting lid assembly in Figure 1 showing it in use.

Figure 3f is a detail cross-section view through the rubbish compacting lid assembly in Figures 3a to e.

10 Figure 4 is a side plan view of a rubbish compacting lid assembly according to a second embodiment.

Figure 5 is a side plan view of a rubbish compacting lid assembly according to a third embodiment.

15 Figure 5 is a side plan view of a rubbish compacting lid assembly according to a fourth embodiment.

Now referring to the illustrations, and in particular to Figure 1, there is a compacting lid assembly 1 including a rim 2, that is adapted to interlock with uppermost perimeter of a bin 4.

20 The rim 2 is adapted to be securely fastened to the bin 4. This is by means of a pair of downwardly and inwardly extending lips 3 on two sides of the assembly, which define channels 2a that engage a lip 5 found at the opening of most conventional domestic 'kitchen' bins made from plastic.

25 It is to be understood by a person skilled in the relevant art, that while the assembly is illustrated as a unit that can be adapted fit to a bin such that it is removable, it can also be provided in the form of a bin with the unit permanently attached.

There is an uppermost lid element 6 adapted to close the opening to the bin, and a lower compacting element 8 adapted to compact the contents of the bin 9 during the closing process, and when the lid is closed.

5 The rim 2, has a high back 10 on one edge, this allows for both the lid 6 and compacting element 8 to be pivotally connected to the rim such that the pivot point 14 for the lid 6 is attached to the rim at a point above the pivot point 12 for the compacting element 8. At its other end, the lid 12 has a handle 13.

10 There are a pair of connecting elements 16, one on each side of the compacting element a first end of which is pivotally connected to a second end of the compacting element 8. The second end of the connecting element is then pivotally connected to the lid at a point approximately half way between the pivot point for the lid 12, and the handle. The connecting element transmits the force applied by a user at the handle of the lid to the compacting element. Furthermore, the connecting element ensures that the compacting element is 15 pulled out of the way when the lid of the bin is opened.

The components of the compacting assembly 1 can be fabricated out of sheet metal, or moulded in an engineering plastic, depending upon the intended size and application.

20 The relative position of the links' 16 pivot connections is such that as the lid 6 is brought into a closed position the compactor 8 is lowered with a compacting action, and a mechanical advantage is achieved between any force applied to the lid as compared to a resultant compacting force provided by the compactor against any rubbish within the container, which is increased as the lid is closed.

25 The alignment of the axis of said pivot connection at the rear of the lid as compared to the axis of the pivot connection between the link and the compacter member is such that the alignment of the axis of the pivot connection between the lid and the link will pass through a plane defined by the first said two axes so that there will be an over center position reached when the lid is in a closed position, whereby the lid will be kept thereby in a closed position.

30 Referring now to Figures 3a to e, the arrangement of the assembly is such that there is a mechanical advantage created; furthermore, as the lid is closed, the

mechanical advantage of the arrangement increases, as the load moment arm L decreases. This mechanical advantage will be of increasing advantage for larger bins, then the benefit of the mechanical advantage inherent in this arrangement would become even more appreciable.

- 5 There are a pair of springs 18, one each side of the compacting element 8, extending between the point at which the connecting element pivotally connects to the second end of the compacting element B, and the pivot point of the lid element 14. In some of the drawings these springs 18 are illustrated using a dashed line. The purpose of the spring is to offset to at least some degree the weight of the compacting element. Referring now to Figure 3f, when the lid 6 is in the closed position, the line of action of the connecting element, which is defined as the line between the pivotal attachment points A and B at either end of the connecting element 16, passes through the line of action of the spring 18, until the end A of the connecting element that is attached to the lid 6 is below the line of action of the spring 18; this creates an over centre locking effect, so that the load in the spring causes to hold the lid shut, and the lid will not open on its own. If however the lid is opened a little, the connecting element will again pass through the line of action of the spring, and once this alignment is destroyed by further opening, the spring, if sufficiently powerful, can open the lid to the full extent of its travel. Various features or mechanisms may be employed to assist a user to move the lids connecting element through the line of action of the spring so that the lid may be opened. These might include a shelf attached to the rim of the bin, which is adapted to allow the four fingers of a hand to push against, whilst the thumb of the hand wraps around and grips the handle and lifts the lid. Alternatively, the bin may include a foot pedal, so that a users foot can anchor the bin whilst their hand lifts the lid.
- 10
- 15
- 20
- 25

- 30 When the lid is closed, the waste remains under the compressive effects of the compacting element. After remaining under this compressive loading for a while, it has been observed that the waste material loses its elasticity, so that the next time the lid is opened, the material does not spring back, and the space occupied by the compacting element when the lid is closed, remains free to accept further waste. Consequently, the compacting effort does not increase with each and every successive use of the bin and its compactor, instead only a small amount of effort is required to compact the newly introduced waste.

Referring now to Figures 4a to d, which illustrate a further form of the invention, wherein the compactor assembly 100 is adapted to be fitted to a conventional 'wheelie bin' 102. This compacting assembly is arranged so that the lid 104 and compacting element 106 can open even further. This is important, if the assembly is to be capable of surviving the truck based lifting and emptying systems employed by most councils. The lid 104 and compacting element 106 are adapted then so that they are clear of any rubbish falling out of the bin 102 when it is inverted during emptying operations. This is achieved by setting the pivot points of both the lid and compacting elements further back from the front of the bin, furthermore, the pivot point for the lid is set further back than the pivot point of the compacting element.

The assembly can be fitted to the bin via a first lip 108 along the back of the assembly 100 that engages the handle of the bin 110, and a second lip 112 in the front of the assembly 100 that engages the front rim 114 of the bin.

Referring now to Figure 5, which illustrates an assembly for a kitchen bin assembly 120, that incorporates a pedal 122 operated mechanism of initiating opening of the lid 124.

Figure 6 illustrates an assembly with a lid 130 that firstly has a horizontal closed position as opposed to a forward and downwardly sloping one. In addition, the upper surface of the lid in this instance forms part of the bench top 132, and the bin itself is a cupboard 134.

Significant advantages of the rubbish compacting lid assembly for a bin according to the present invention therefore is that the springs will offset the weight of the compacting element when the lid is being opened, and yet the lid, when closed, will remain closed without the need for using catches or the like to hold the lid shut.

It is considered therefore that a rubbish compacting lid assembly for a bin such as that described herein would prove to be of considerable benefit to those who wish to maximize the storage capacity of their bin while allowing for a very efficient mechanism.

Although the invention has been herein shown and described in what is conceived to be the most practical and preferred embodiment, it is recognised that departures can be made within the scope of the invention, which is not to be limited to the details described herein but is to be accorded the full scope of the specification so as to embrace any and all equivalent devices and apparatus.

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Dated this 26th day of March 2004

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By their Patent Attorneys,

COLLISON & CO.

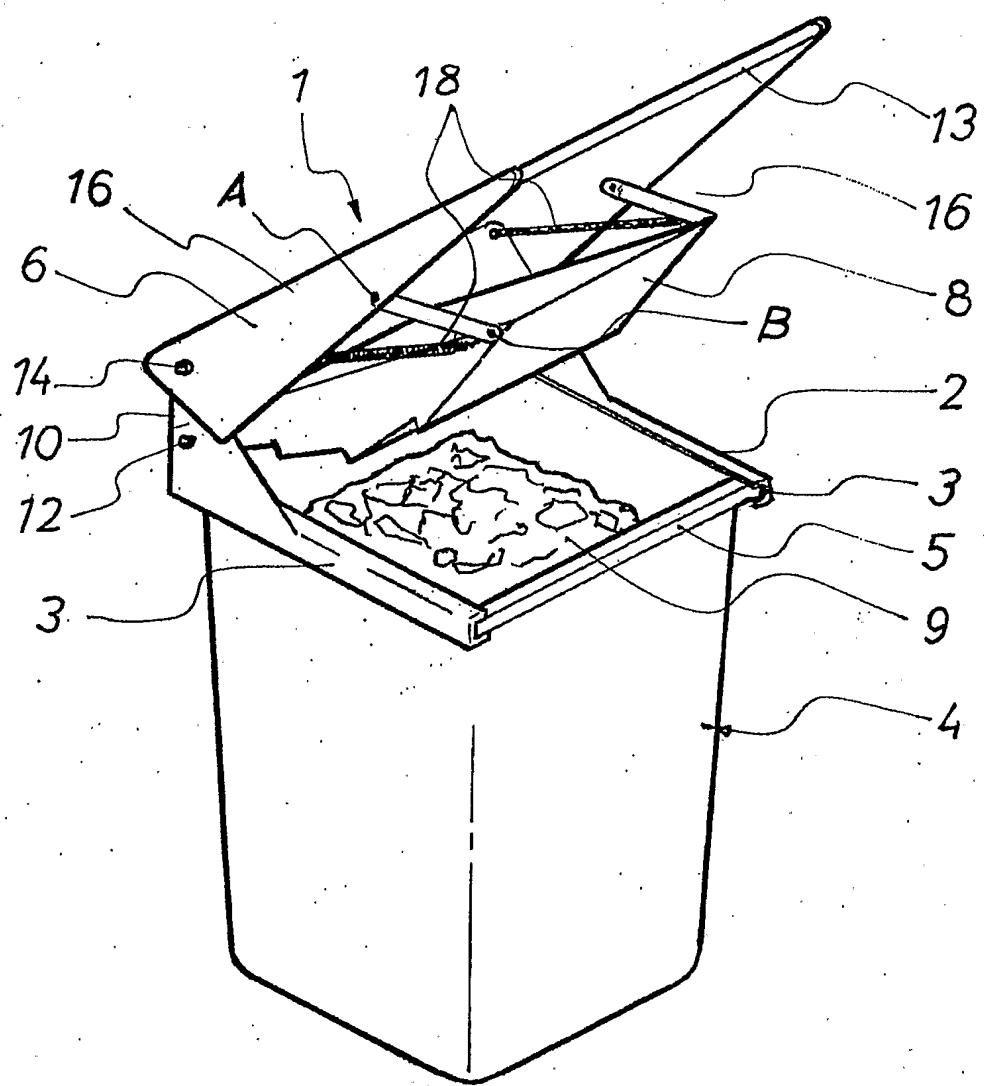


Fig 1

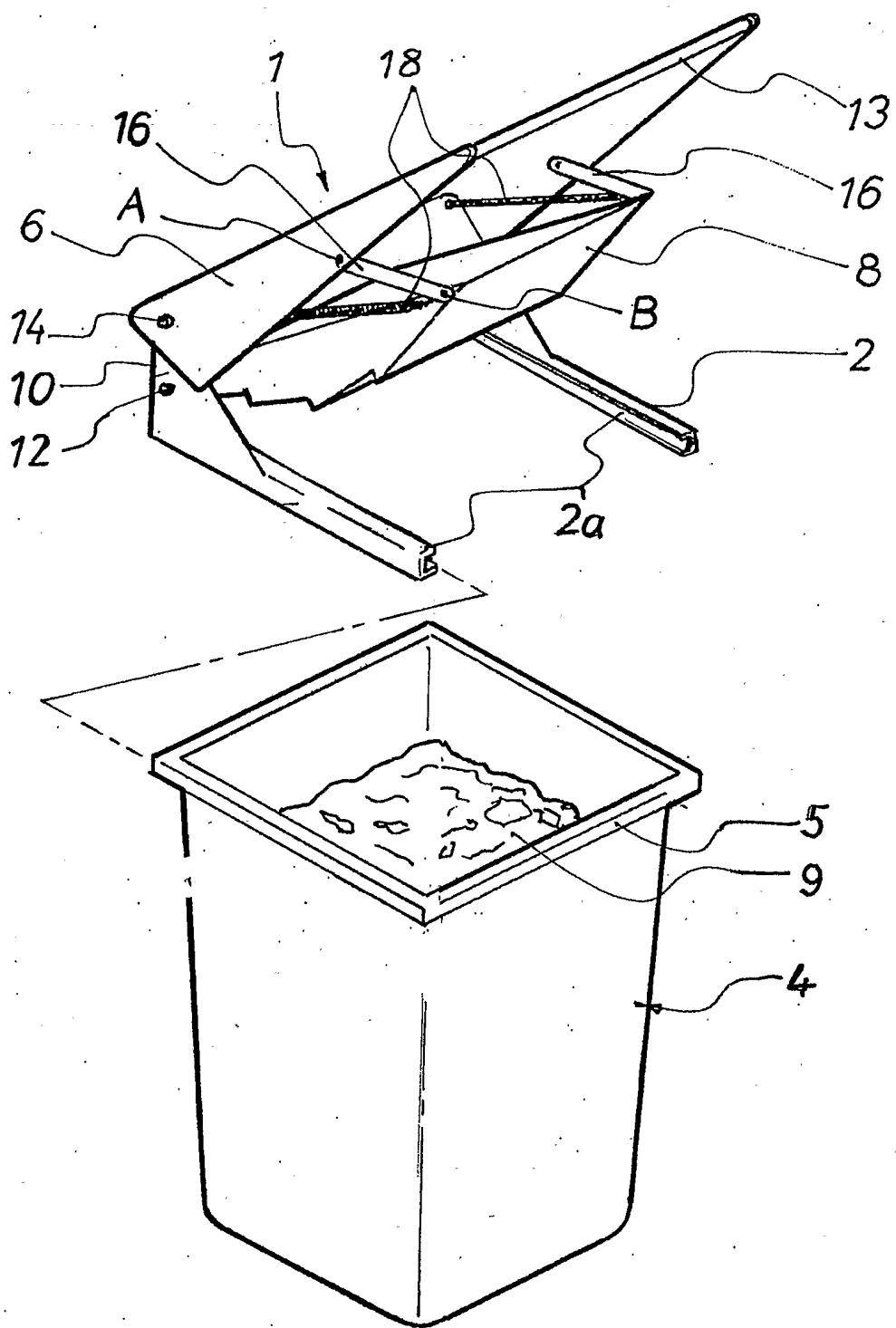


Fig 1b

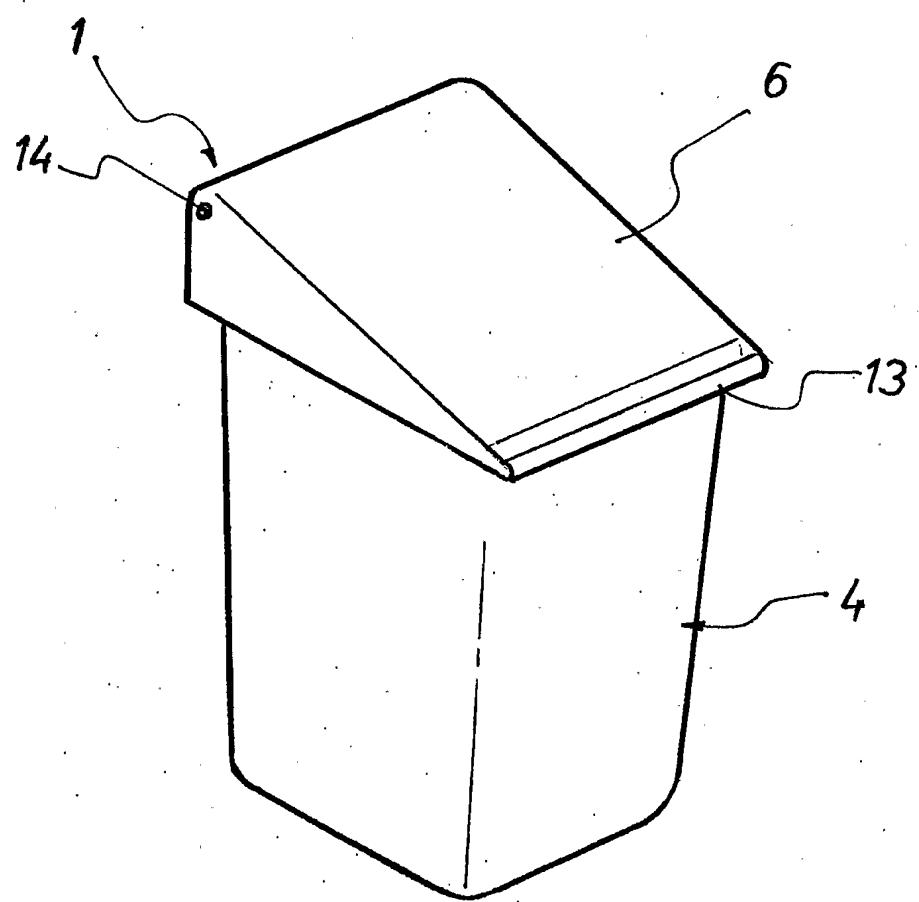


Fig 1c

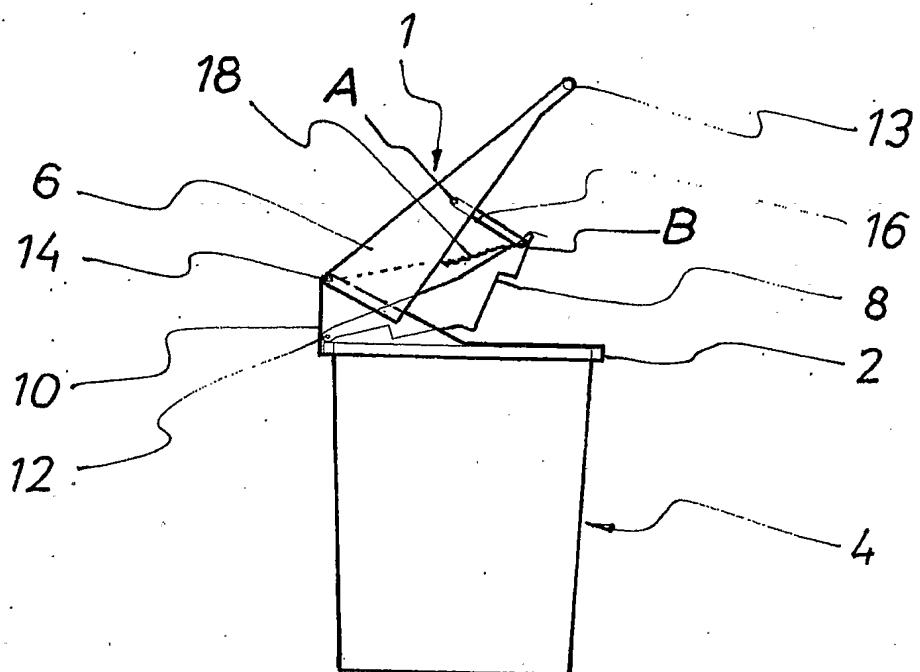


Fig 2

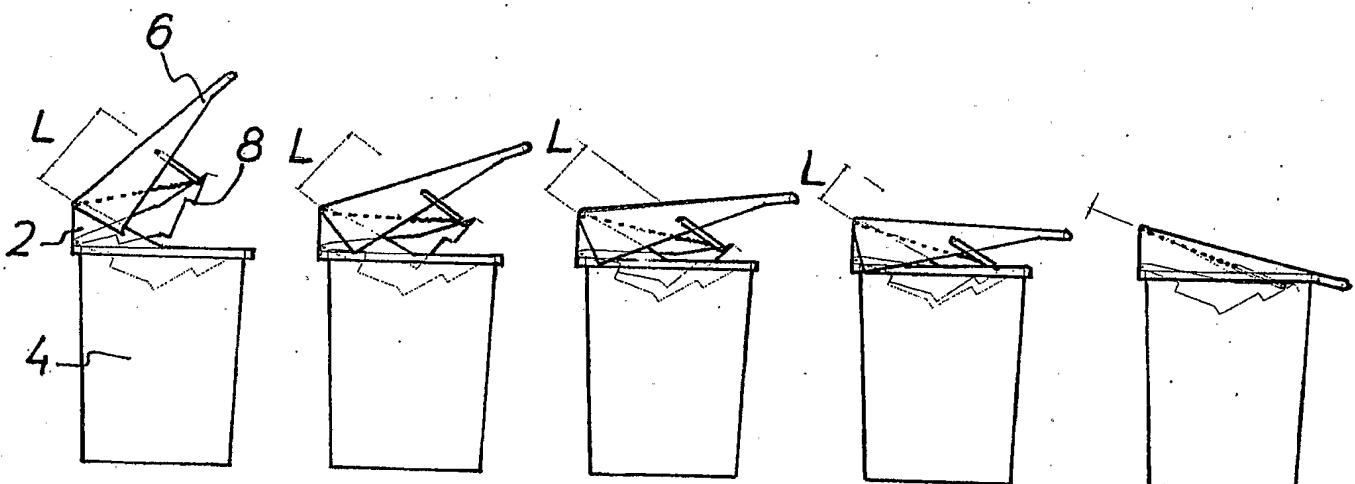


Fig 3a

Fig 3b

Fig 3c

Fig 3d

Fig 3e

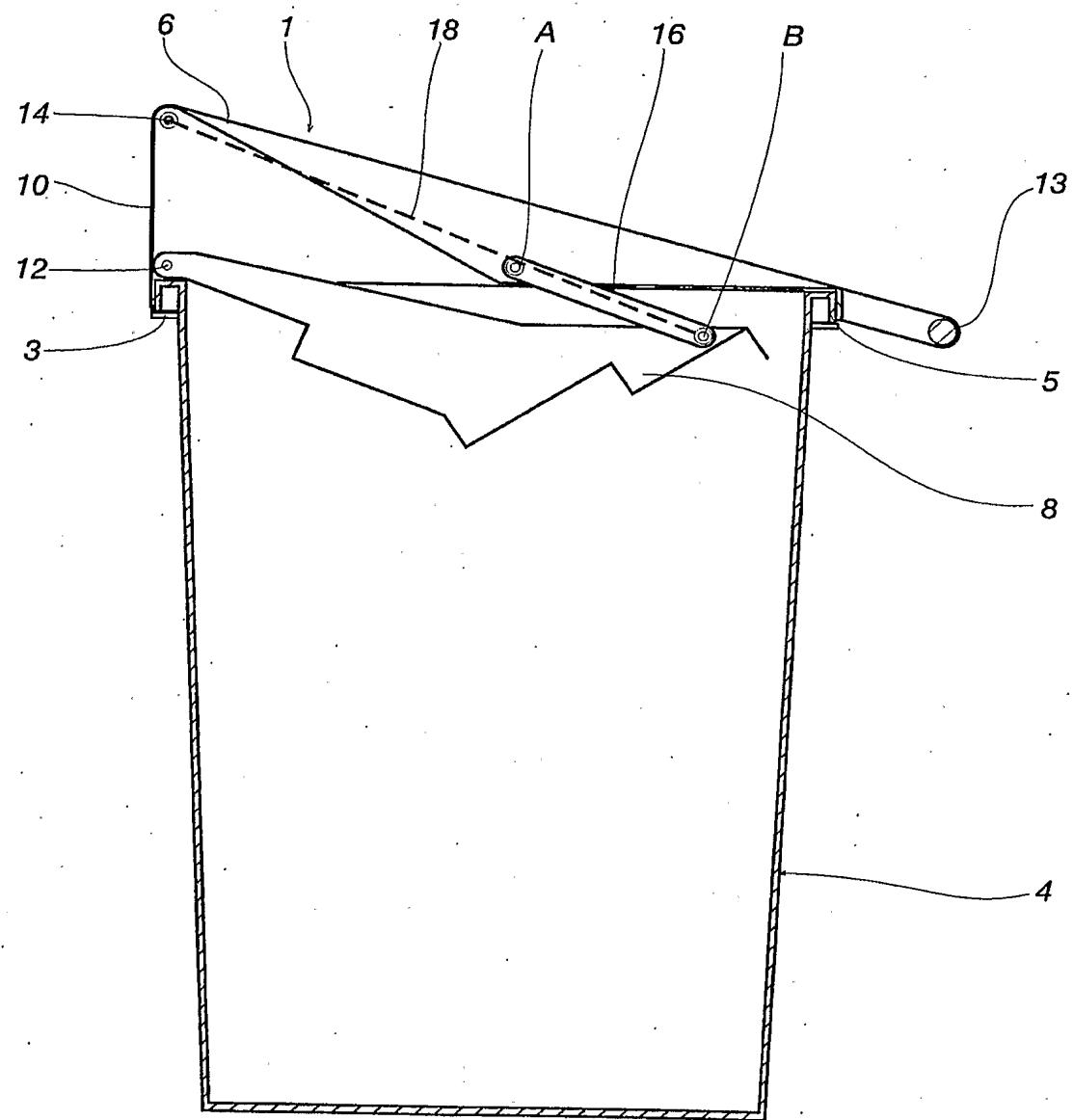


Fig 3f

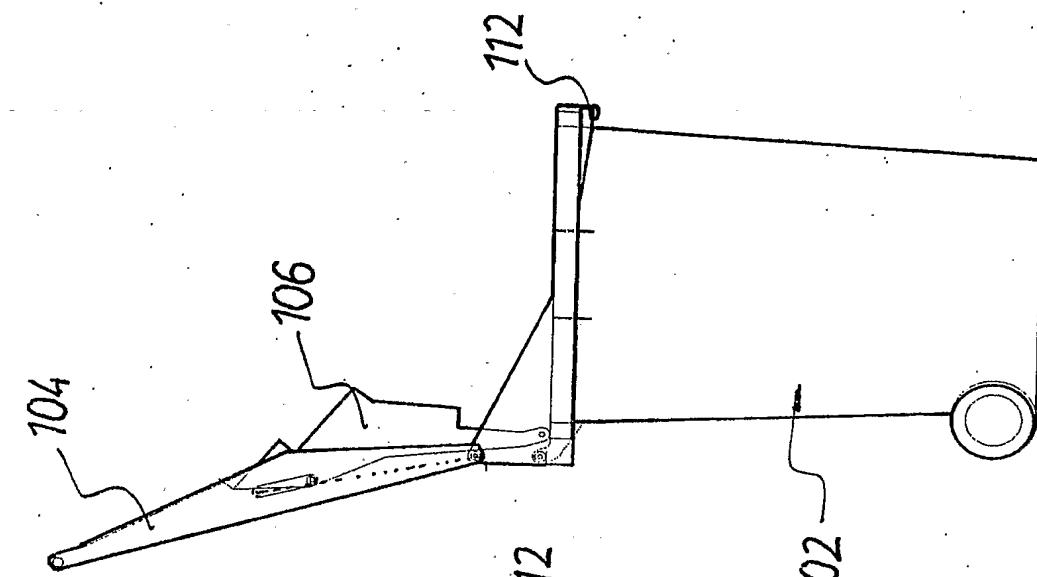


Fig 4c

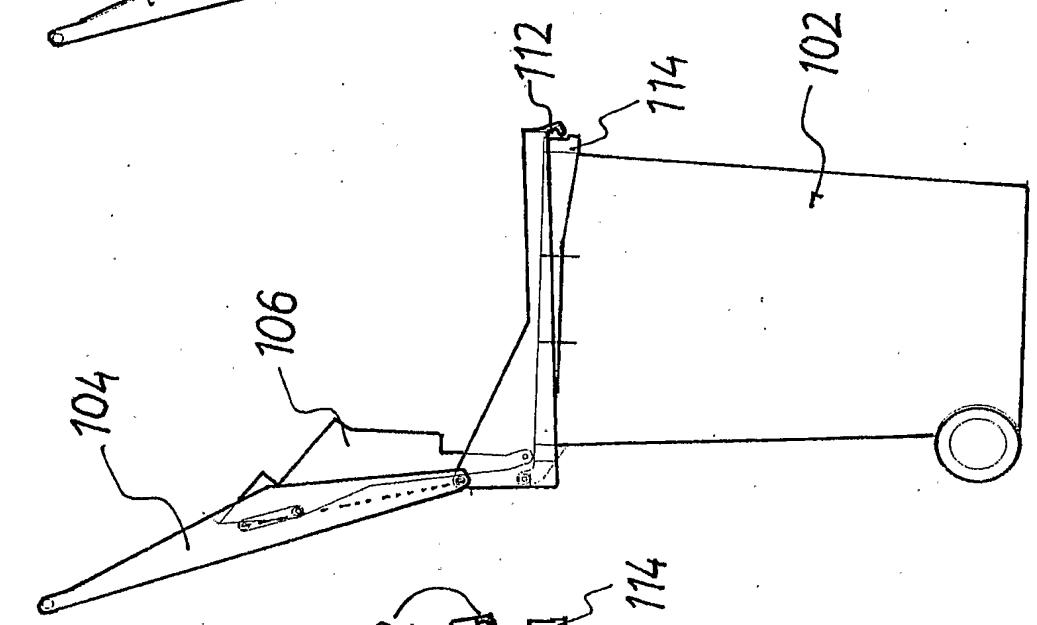


Fig 4b

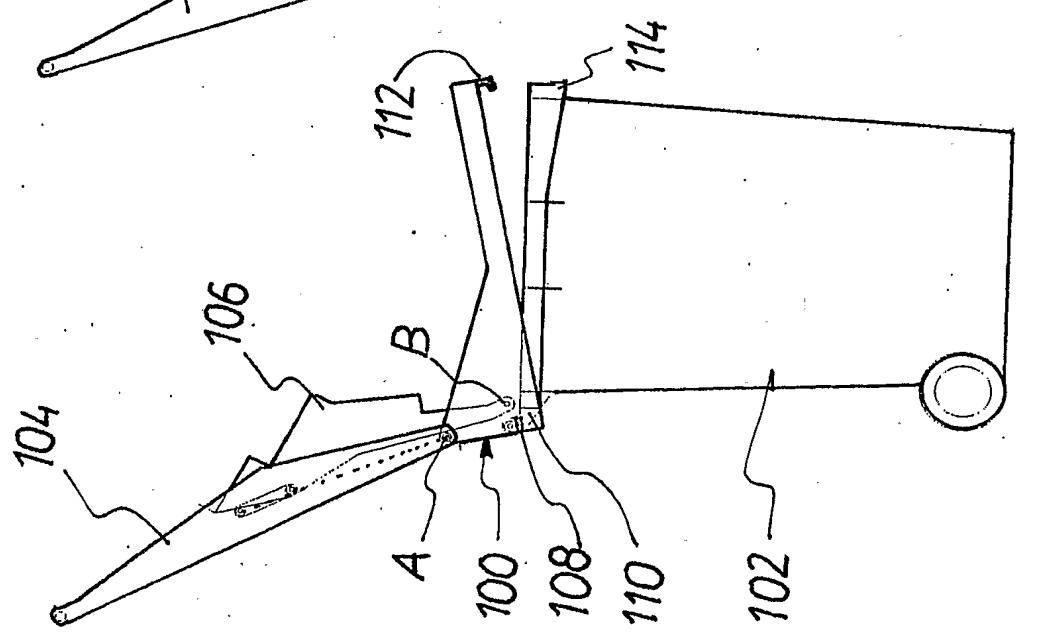


Fig 4a

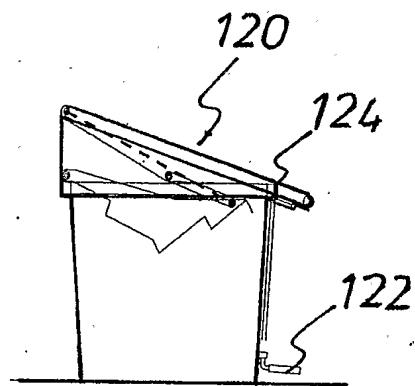


Fig 5a

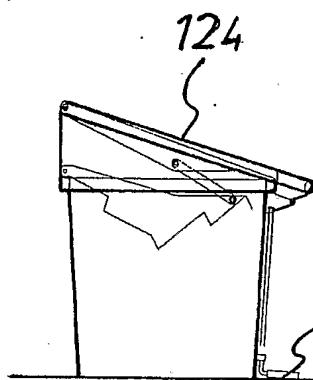


Fig 5b

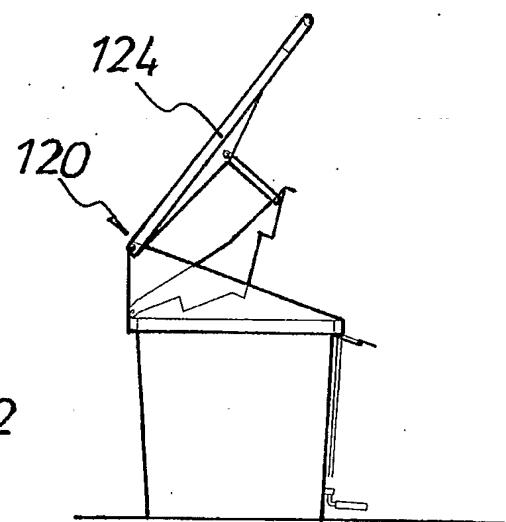


Fig 5c

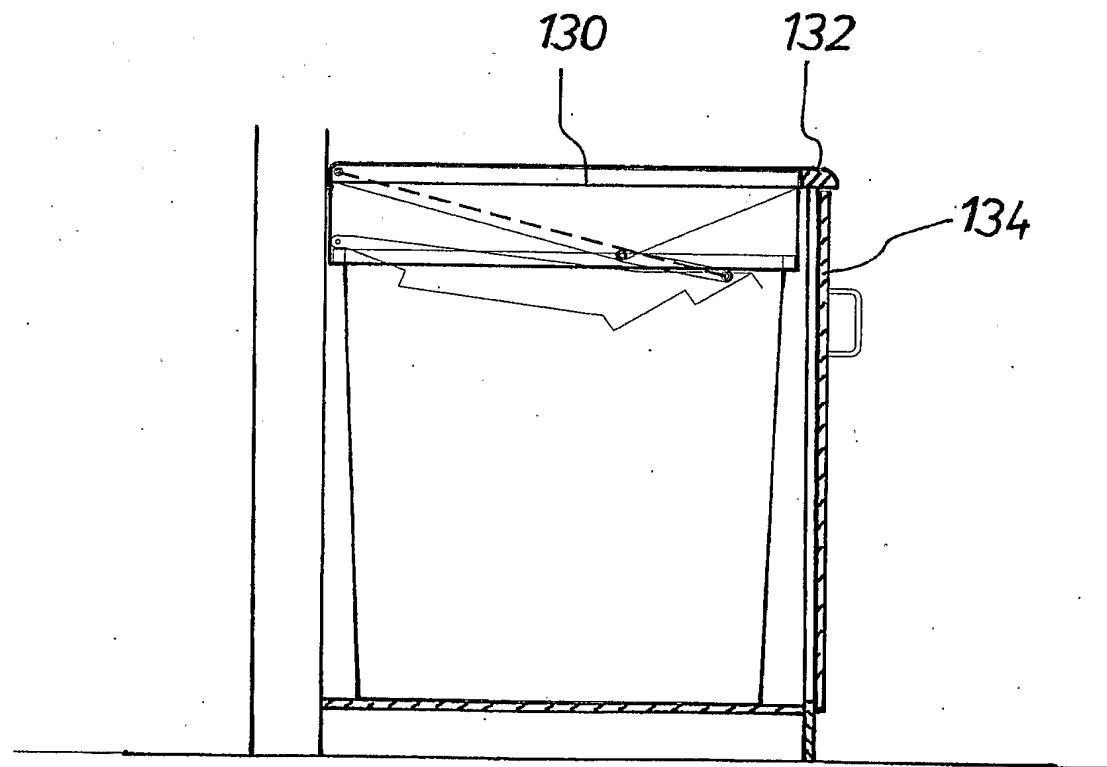


Fig 6